

## ABSTRACT

An electromagnetic machine includes a rotor having a plurality of poles and a stator also having a plurality of poles. The poles for the rotor are divided into a first and second set of radially opposed pairs. The first set has uniform faced poles. The second set has a notched face. The stator includes radially opposed pairs of poles having uniform faced poles. The rotor and stator are disposed for movement relative to each other such that the first and second sets of poles for the rotor are movable in relation to the radially opposed pairs of the stator. The electrical interaction between uniform faced poles of the rotor with uniform faced poles of the stator produces a first normal force profile. The electrical interaction between notched faced poles of the rotor with uniform faced poles of the stator produces a second normal force profile. The first and second normal forces act dynamically in time or position on the stator as the rotor moves in relation to the stator. Thus, the noise spike at the harmonics of the commutation frequency are reduced.